

Claims

1. A vehicle including a chassis having a fore and aft axis, a differential gear having a differential carrier, the differential carrier being pivotably mounted relative to the chassis about said axis, the differential gear having two opposite half shafts, each half shaft being connected to a respective wheel hub, the vehicle further including two opposite tie rods, each said wheel hub having one end of a respective tie rod pivotably connected thereto, the other end of the respective tie rod being pivotably connected to the chassis, the differential carrier and the chassis having a control arm pivotably attached therebetween, whereby on cornering of the vehicle the control arm constrains the differential carrier to pivot relative to said chassis, in a predetermined manner.
2. A vehicle according to claim 1, wherein the respective tie rods are pivotably mounted on a common upper collar, the upper collar being pivotably mounted on the chassis above the differential carrier.
3. A vehicle according to claim 2, wherein the upper collar is coaxially mounted on an upper cylindrical member of the chassis.
- 20 4. A vehicle according to claim 3, wherein bearings are provided between the upper collar and said upper cylindrical member to minimize friction.
5. A vehicle according to any of claims 2-4, wherein two opposite pairs of tie rods are provided above and below the respective half shaft.
- 25 6. A vehicle according to claim 5, wherein respective tie rods are pivotably mounted on a common lower collar, the lower collar being pivotably mounted on the chassis underneath the differential carrier.
- 30 7. A vehicle according to claim 6, wherein the lower collar is coaxially mounted on a lower cylindrical member of the chassis.

8. A vehicle according to claim 7, wherein bearings are provided between the lower collar and said lower cylindrical member to minimize friction.
9. A vehicle according to any of claims 2-8, wherein each of the upper and 5 lower collars have a radius arm extending therefrom on the same side, a link being pivotably connected between the radius arms.
10. A vehicle according to claim 9, wherein the radius arms are of equal length.
- 10 11. A vehicle according to claim 9 or claim 10, wherein the radius arms are parallel.
12. A vehicle according to any of claims 9-11, wherein the control arm is pivotably connected between one of the radius arms and a radius member of the 15 differential carrier.
13. A vehicle according to claim 12, wherein the radius member is longer than the radius arm connected thereto.
- 20 14. A vehicle according to claim 12 or claim 13, wherein the radius member and the associated radius arm are parallel.
15. A vehicle according to claim 14, wherein the radius member is twice as long as the radius arm.
- 25 16. A vehicle according to any of claims 2-15, wherein the vehicle further includes a suspension means operatively connected between said chassis and respective wheel hubs and having opposite attachment points, said suspension means being operable to permit vertical movement of the chassis relative to the ground.

17. A vehicle according to claim 16, wherein the suspension means includes a chassis arm pivotably connected to the chassis, said chassis arm being pivotably connected to one of said attachment points.
- 5 18. A vehicle according to claim 17, the suspension means comprising opposite compressible suspension units, wherein both units are pivotably connected to said chassis arm.
- 10 19. A vehicle according to claim 17 or claim 18, wherein the chassis arm extends from said upper collar, and is perpendicular to the ground in the upright rest condition of the vehicle.
- 15 20. A vehicle according to any preceding claim, wherein the fore and aft axis is on a geometric centre line of the vehicle.
21. A vehicle according to any preceding claim, wherein the fore and aft axis passes through a centre of mass of the vehicle.
22. A vehicle according to any preceding claim, wherein each half shaft is pivotably connected to a respective wheel hub via an outer universal joint.
- 20 23. A vehicle according to claim 22, wherein each half shaft is pivotably connected to the differential gear with an inner universal joint.
- 25 24. A vehicle according to claim 23, wherein at least one of the respective inner and the outer universal joints provides for a change in length of the respective half shaft.
- 30 25. A vehicle according to any preceding claim, wherein the differential carrier is pivotably mounted on the chassis with bearings.

26. A vehicle according to any preceding claim, the vehicle further including an engine, wherein the engine has a shaft drive output on said axis and connected to the differential.

5 27. A vehicle according to any of claims 1-25, wherein the vehicle further includes an engine, the engine having a drive output perpendicular to said axis and driving a parallel lay shaft, the lay shaft having a universal joint connected to an input member of the differential, the input member being on said axis so as to provide for pivoting of the engine relative to the differential carrier.

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28. A vehicle according to any preceding claim, wherein the engine is connected to the differential carrier.

15 29. A vehicle as substantially described herein with reference to Figures 1-6 of the accompanying drawings.

30. A drive train assembly for a vehicle including a chassis having a fore and aft axis, a differential carrier and a control arm, the differential carrier being pivotably mounted relative to the chassis about said axis, the differential carrier and the chassis 20 having a control arm pivotably attached therebetween, whereby on pivoting of the chassis about said axis the control arm constrains the differential carrier to pivot relative to said chassis, in a predetermined manner.

31. A drive train assembly as substantially described herein with reference to 25 Figures 1-6 of the accompanying drawings.